The average date of planting corn was found to be May 4. Corn has been planted on or before May 4, 11 times and after that date 9 times out of the 20 years used in this comparison. Eight of the eleven years when corn was planted on or before May 4 gave yields above the average and 3 below. In the 9 years that corn was planted after May 4, the crop was above the average four times and below five times. By planting corn in this section before May 4 there is an advantage of 3 to 1 that the crop will average 25 bushels or more per acre, while if it is planted after May 4 the chances of a normal crop or more is less than 50 percent.

The reason for this is found by reference to table 2. The time of tasseling of the corn crop was determined from the Weekly Weather and Crop Bulletin the same way that the date of planting had been, and was found to be about 70 days after the date of planting. Seventy days after planting, or May 4, is July 13, just 2 days after the period of the higher average of rainfall of July. If corn is planted after May 4 the tasseling period comes in the drier periods of the latter part of July. The correlation coefficient for the period July 12–21 was +0.51, the highest value of any of the 10-day periods. The coincidence of the high value of r for this period with the average date of tasseling indicates that the tasseling period is the most critical in the life of the corn plant.

The conclusions are:

(1) The tasseling period is the most critical period of the corn plant's life.

(2) The average date of tasseling in northeastern Kansas is July 14.

(3) Two and one-half inches, or more, of rain near the tasseling period practically insures a crop of 25 bushels per acre.

(4) The latter part of July is, on the average, drier than the earlier part.

(5) Corn planted before May 4 usually reaches the critical period of its life before the dry weather begins.

DIURNAL VARIATION IN THE DEW-POINT TEMPERATURE AT ASHEVILLE, N. C.

By Leland T. Pierce

[Weather Bureau office, Asheville, N. C., July 1934]

Dew-point temperature is a direct index of the amount of moisture in the air, and therefore is subject to a number of practical applications in the identification of air masses and in forecasting. It is of particular value in the prediction of minimum humidities, and in this role is especially important in the preparation of fire-weather forecasts such as are issued in this fire-weather district no. 8. Its value in this work has prompted the investigation of its diurnal variations, since a forecast of the minimum humidity for the day must be based upon its anticipated level at the time of the maximum temperature, as varying from the 8 a. m. figure.

The premise upon which forecasting of minimum humidity was initiated in this district assumes that there is little regular diurnal variation in the moisture content of the air, except as induced by changes in the air mass. However, it has been found by experience that dew points do change very materially throughout the day. It is plain, then, that if the diurnal variation both as to direction and amount can be allowed for under varying conditions, it will be possible to make more accurate forecasts of the minimum humidity. To determine this variation, it has been necessary to summarize a large amount of data, thereby balancing out changes incident to storm movement and local factors.

Progress in this work was beset with many difficulties other than the large amount of routine work involved. First, it was realized that a number of variables can and do have a definite effect upon the dew-point, such as air-mass changes, the effect of seasonal changes in transpiration from forest areas, and a multiplicity of local variants, most of which cannot be measured. The most disconcerting was lack of faith in the absolute accuracy of psychrometer readings. It is well known that the human element bulks large in determining the accuracy of psychrometer observations, as does the condition of the muslin on the wet bulb. Cases have been seen on this station when the dew-point figure has been lowered as much as 12 degrees simply by putting on a clean muslin. It is evident, too, that the errors due to personal inaccuracy and dirty wet bulbs are all in the same direction, and therefore are not self-compensating. However, fully realizing these inherent weaknesses of psychrometer readings, the work was necessarily conducted on the assumption that all original data are correct. Furthermore, it is believed that air masses, no matter how large, are by no means strictly homogeneous as regards moisture content. In consideration of these and other possible difficulties, records were taken for several years that extended over a period when observations were made consistently by the same two men.

It was assumed at the outset, and conclusions reached in this study verify the assumption, that cloudiness and wind direction, more than any other factors, have a bearing upon diurnal changes in the dew point. Therefore, dew points were classified according to occurrence on cloudy or on clear to partly cloudy days. This division into two classes only was made with the idea of keeping the routine work at a minimum, but it has since been concluded that a more detailed cloudiness classification should have been made. Figures were available, of course, for 8 a. m., local noon and 8 p. m. E. S. T., and in the tabulation the wind direction was included with each dew point, as was the prevailing direction for the day. The period of record covered was 1926 to 1932, inclusive. In order to suit the uses to which the data are to be put, noon and 8 p. m. dew points have been expressed in terms of departure from the 8 a. m. value. Emphasis has been placed upon the variations between morning and noon because this is the period of greatest importance in fire-weather forecasting. The first portion of this report deals with a recitation of facts concerning changes and trends, the explanation therefor being reserved for a later section.

TABLE 1.—*Average monthly departure local noon and 8 p. m. dew points from 8 a. m. values*

Year	Time	January	February	March	April	May	June	July	August	September	October	November	December	Annual
						CLEAR TO PARTLY CLOUDY								
1932	Noon	−0.4	−2.6	−0.7	−2.1	−3.8	−1.5	−3.4	−4.3	−3.3	−2.0	−0.6	+6.4	−1.5
	8 p. m.	+2.0	−1.2	+2.1	+1.6	−0.7	+0.3	−0.7	+0.8	−0.1	+3.6	+1.4	+4.7	+1.1
1931	Noon	−0.3	−0.6	−0.3	−1.8	−0.4	−1.0	−0.9	−1.8	−0.6	−1.8	−0.1	+0.3	−0.7
	8 p. m.	+0.2	−0.7	+0.9	+0.4	−1.5	+0.8	+2.9	+1.4	+1.0	+0.2	+3.4	+2.0	+0.9
1930	Noon	+1.7	+0.5	−2.0	−1.3	−2.5	−2.5	−4.9	−4.2	+0.1	−1.0	−1.3	−1.9	−1.6
	8 p. m.	−1.4	+1.3	−0.6	0.0	−1.3	−0.5	−1.4	−0.6	+1.2	+0.9	−2.9	−1.6	−0.6
1929	Noon	+0.2	−0.4	−0.6	−4.2	−1.5	−2.3	−1.6	0.0	−0.9	−0.8	+0.4	+2.9	−0.7
	8 p. m.	+0.5	+2.0	+0.5	−2.2	+0.2	+0.8	+0.8	+1.2	+1.8	+1.8	+0.5	+4.5	+1.1
1928	Noon	+1.1	+0.5	−2.0	−2.9	−4.7	−1.6	−2.4	−0.6	−0.6	−0.4	−0.7	+1.5	−1.1
	8 p. m.	+3.5	+0.8	−1.0	−0.8	−1.8	−0.3	+0.5	+1.7	+3.8	+1.0	+0.7	+1.6	+0.8
1927	Noon	−1.8	−3.4	−2.6	−4.9	−2.7	−0.8	−2.9	−0.3	−0.9	−1.8	−0.2	−0.8	−1.8
	8 p. m.	−0.8	−0.8	+0.4	−1.0	+0.3	+2.7	+0.3	+2.5	+1.0	−0.1	+3.3	−1.5	+0.5
1926	Noon	−1.1	+0.2	−1.8	−1.6	−2.5	−3.1	−2.2	−1.6	+0.5	−0.8	−3.1	+1.3	−1.2
	8 p. m.	−0.5	+0.8	−0.3	−0.8	−0.6	−0.3	+0.5	+1.2	+1.5	+2.8	−2.4	+0.9	+2.7
Average	Noon	−0.09	−0.83	−1.43	−2.69	−2.59	−1.83	−2.61	−1.74	−0.81	−1.23	−0.80	+1.39	−1.23
	8 p. m.	+0.50	+0.49	+0.29	−0.40	−0.77	+0.50	+0.41	+1.17	+1.46	+1.46	+0.57	+1.51	+0.96
Percent cases		64	71	69	74	79	81	80	79	70	74	57	61	71.6
						CLOUDY								
1932	Noon	+1.5	−0.9	+0.7	+1.0	−0.2	+2.0	−0.2	−1.7	−0.5	+2.2	+1.2	+1.1	+0.5
	8 p. m.	+4.1	+0.7	−0.1	+1.0	+3.2	+1.0	+1.4	+0.7	+1.4	+2.5	−1.4	+3.4	+1.4
1931	Noon	+3.8	+1.8	+1.5	+1.1	+2.9	−2.0	0.0	+0.4	0.0	+5.3	+1.2	+2.6	+1.5
	8 p. m.	+3.0	+4.2	+3.1	0.0	+1.9	+1.5	+9.7	0.0	−0.2	+6.6	+0.7	+4.1	+2.9
1930	Noon	+1.6	+5.5	+2.7	+3.0	+0.5	+0.3	+1.3	−1.0	0.0	0.0	+0.6	+1.9	+1.4
	8 p. m.	+2.5	+5.5	+3.2	+0.9	+3.2	+1.3	+2.8	−1.4	+1.0	+0.3	−1.3	+1.9	+1.6
1929	Noon	+5.1	+0.6	+1.4	−6.3	+2.3	−2.0	−2.0	+1.6	+1.1	+1.2	+0.3	+5.0	+0.8
	8 p. m.	+7.1	+2.7	+3.0	−6.0	+2.2	−0.2	+1.0	+1.6	+2.6	+1.1	+0.4	+4.0	+1.7
1928	Noon	+5.0	+1.7	−0.4	+0.5	+1.1	+1.4	−0.9	−0.6	−0.2	+1.8	0.0	+2.8	+1.1
	8 p. m.	+3.0	+4.7	+2.5	−0.3	+1.9	+1.9	+1.7	−0.9	−0.3	+4.2	+1.1	+3.8	+2.1
1927	Noon	+4.0	+2.1	+1.6	+1.4	−0.9	+1.0	−0.1	+0.6	−0.7	+1.6	+0.9	+4.3	+1.3
	8 p. m.	+2.0	+3.1	+2.7	+2.1	+1.4	+1.3	+1.9	+2.6	−1.0	−0.8	+0.2	+5.0	+1.7
1926	Noon	+2.5	−0.5	+1.6	−1.2	−2.0	−2.2	+0.2	+0.7	+0.9	+1.6	+3.4	+2.5	+0.6
	8 p. m.	+3.5	−5.8	+5.5	−0.7	−2.7	−2.4	+0.2	+1.0	+2.2	+1.0	+1.1	+3.8	+0.5
Average	Noon	+3.36	+1.47	+1.30	−0.07	+0.53	−0.19	−0.24	0.00	+0.09	+1.96	+1.09	+2.89	+1.03
	8 p. m.	+3.60	+2.16	+2.84	−0.43	+1.59	−0.63	+2.67	+0.51	+0.81	+2.13	+0.11	+3.71	+1.70
Percent cases		36	29	31	26	21	19	20	21	30	26	43	39	28.4

DIURNAL VARIATION IN DEW POINT

That there is a daily fluctuation in the dew point between a maximum during the night and a minimum in early afternoon, is shown by average figures presented in table 1, which are represented graphically in figure 1.

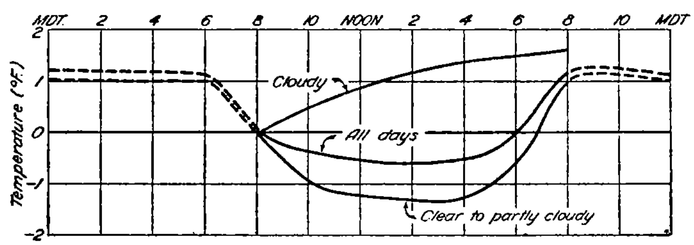

FIGURE 1.

The average annual departures for noon and 8 p. m. were used together with zero for 8 a. m. to fix the shape of the curve. It is obvious that each set of figures for individual months, given in table 1, could be used in drawing similar diurnal curves, but these, as is readily seen, would show an almost infinite variety of trends, for the reason that nonperiodic controls generally outweigh the diurnal tendency, and conditions vary from month to month.

Since data were available for the daytime only, the curves could be drawn with certainty only between 8 a. m. and 8 p. m., the extensions being based upon personal judgment in the light of processes involved. No attempt was made to complete the curve for cloudy days, since the data available did not indicate any natural cycle, though further research on the subject might disclose information for basing extensions of the line. This rising tendency for cloudy days, rather than representing a recurring diurnal cycle, merely expresses the fact that cloudiness in general precedes or accompanies precipitation, and therefore the portion shown is in reality just a section of a steadily rising curve.

TABLE 2.—*Variation of forenoon dew-point departures with wind direction and velocity*

Direction	Velocity 0–10 m. p. h.		11–20 m. p. h.		21 m. p. h. and over	
	Number of cases	Average departure	Number of cases	Average departure	Number of cases	Average departure
		°F.		°F.		°F.
N	48	+.31	58	−1.98	2	−5.00
NE	2	+.50				
E	8	−2.00	2	−3.50		
SE	76	+.86	74	+1.61		
S	99	+.90	55	+1.05	2	−8.00
SW	9	+1.10	3	−6.70		
W	13	−.61	5	−5.20		
NW	169	−.99	132	−2.80	15	−5.13

The deviation from the average curves which may be expected on a given day is, of course, very wide, since, as pointed out above, the immediate causes of change may completely obliterate the diurnal trend. It has been found that changes of air mass, with or without marked wind shift, are responsible for the widest dew-point changes. Irregularity in cloudiness through the day accounts for many other changes, but a number of wide departures occurred in original data, the reasons for which could be found only in unexplainable local causes.

Effect of wind direction and velocity upon forenoon dew-point changes.—Wind direction, as stated at the outset, was considered one of the factors most likely to have a direct bearing on the tendency of the dew point. This was based on the simple fact that most rain-bearing winds are of southerly origin, while the drying winds blow from the northwest. A separate tabulation was made covering the 5-year period 1928 to 1932, including each day in the normal fire-season periods, February 15 to May 15, and October 15 to December 15. The results of this cross classification are presented in table 2. It is readily seen from this tabulation that wind direction does have a decided effect on the dew-point deviation during the forenoon. The application of these relationships to the diurnal dew-point variation will be further pointed out in the section dealing with physical explanations.

In practically all cases it is seen that plus departures accompany southerly winds, and minus northerly. Furthermore, this study brings out the fact that the amount of deviation varies also with the wind velocity. This might be expected, since winds of higher velocity are naturally more likely to bear air masses having characteristics peculiar to their respective directions. For instance, a weak LOW approaching this section will draw its air supply from regions to the southward, though for topographic or other local reasons the immediate wind direction in Asheville may be northerly. This northerly wind then, in a study of this sort, is classified with other north winds, even though it is really bearing an air mass of tropical rather than polar origin. This is a peculiarity often observed in Asheville, and it is undoubtedly the reason for the plus departure with light north winds shown in table 2.

Dew points computed from the temperature and humidity traces of a hygrothermograph at the Bent Creek Experimental Forest were plotted for a consecutive week in April 1933 to demonstrate the effect of wind direction upon dew-point levels, and to test the diurnal variations just determined. Bi-hourly wind directions and a record of cloudiness are presented along with the dew-point curve in figure 2. One rainy day was included in the period, and it is interesting to note the marked rise in dew point as the wind shifted into the southeast bringing cloudiness and rain, and the precipitous drop with the shift to northwest. Of particular interest, are the traces for the clear days, April 4, 7, and 10. This period was picked at random for cloudiness alone, but with the aid of horizontal lines drawn through the 8 a. m. value for the day, the diurnal tendency is plainly visible, even though it is somewhat distorted by other influences.

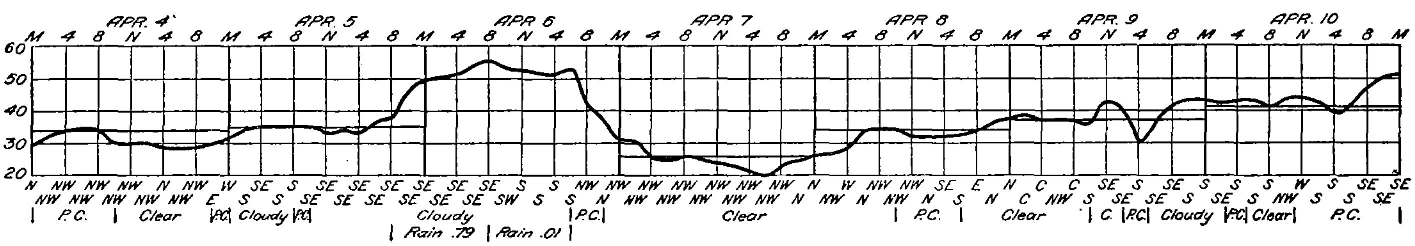

FIGURE 2.

Effect of temperature level upon magnitude of variations.—Throughout the process of manipulating the daily figures, it was noticed that the level of the dew point had a decided effect on the magnitude of diurnal variations. During the winter and early spring the scattering of individual deviations varied much wider from the normal than during the warmer months. This may be a true effect of the temperature level itself, but it is probably induced largely by the natural differences in seasonal storm activity. The inherent tendency for unit errors in determining the wet-bulb temperature to result in greater errors in the dew-point computation at low temperature levels than at high, is another contributing cause of wider variations at low temperatures. Instructions have been issued at this station for wet-bulb muslins to be changed once each week, and for especial care to be taken in whirling the psychrometer, in order that recorded dew-point changes in all seasons and at all temperature levels can be accepted with confidence. Thus it will be possible, after a time, to check with certainty the effect of temperature level upon the variability of dew-point changes. At the present time (July 1934) daily variations are consistently small, and conform very faithfully to the average trend as shown in figure 1.

TABLE 3.—*Range in noon deviations from 8 a. m. dew points and percentage of cases falling between 5° plus and minus (1926)*

Temperature range	Range of deviation (degrees minus to degrees plus)	Percent of cases between −5° and +5° F.
20° and lower	8 to 18	50
20° to 40°	17 to 16	63
40° to 60°	22 to 9	71
60° and above	10 to 5	95

To get more accurate information concerning the limits of variability with different temperature levels, and the degree of faithfulness with which noon dew points approximated the 8 a. m. figure, a dot diagram was prepared from all data for the year 1926. The results are given in table 3, showing the range within which all noon dew points fell, and the percentage of all which fell within the limits 5 degrees plus and minus. In addition to this, the range of deviation was correlated with the level of the temperature during the winter and early spring months, when the seasonal effect could be eliminated, but little direct relationship was indicated. For this reason, it appears that the fidelity with which noon dew points approximate the 8 a. m. values is a result of characteristic seasonal changes.

SEASONAL VARIATION IN DEW POINT DEPARTURES

The noon and evening dew-point departures were arranged in table 1 according to months in order to bring out any seasonal tendencies which might prevail. The averages, then, were all plotted for the purpose of making the trend plainly visible. When considering these curves, it must be realized that they represent only the average monthly conditions, and that no attempt was made to eliminate the varying effects of seasonal changes in storm activity, precipitation, wind shifts or local variants. Indeed, it is the seasonal variation in the sum total of these nonperiodic causative factors which introduces the element of seasonal change into the matter of diurnal dew-point departures.

On clear to partly cloudy days, as has been shown above, the dew point falls during the forenoon to an approximate minimum near noon. Now, the magnitude of

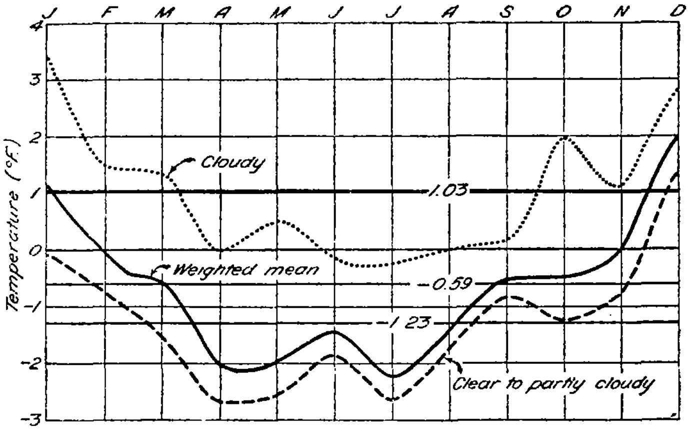

FIGURE 3.

this fall is seen in figure 3 to be greatest in the spring and summer months, and least in the colder seasons. The trend between noon and evening, on the contrary, is upward, reaching a point well above the morning figure by 8 p. m. The smallest positive departures, which actually amounted to a slight negative in April and May, occurred in the warmer season, while greatest positive values were recorded in fall and winter. On cloudy days the diurnal trend is definitely toward a constant rise throughout the daylight hours, but again the lowest positive departures are seen to be in the warmer months. Thus, the tendency, as shown by curves in both figures 3 and 4, is for an agreement in the seasonal variation in

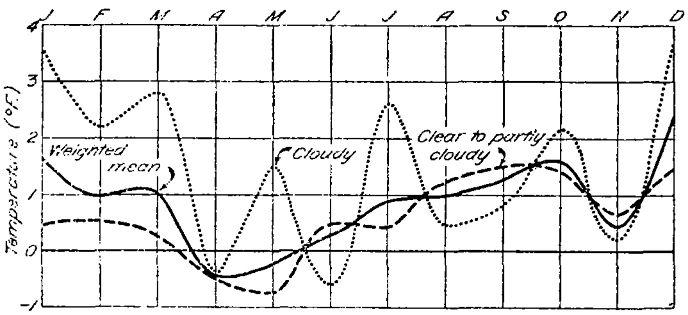

FIGURE 4.

direction and magnitude of diurnal dew-point departures. This applies to all cloudiness and other weather conditions, and to both the noon and 8 p. m. departures.

Thus it is seen that all curves show a dip for the warmer and a rise to a maximum in the colder seasons. This tendency for the curves to parallel each other shows clearly that the seasonal variation of dew-point departures is quite independent of cloudiness or condition of the weather. Of much the same nature is the fact that the vertical distance between the curves is substantially the same at all times of year. This shows that the effect of cloudiness upon the diurnal trend of the dew point is practically constant throughout the year.

Of the four curves analyzed thus far, all but the one for evening departures on cloudy days are fairly smooth, and are homologous in shape. The remaining one is an exception to this rule, being very erratic, due to the relatively small number of cases represented. It is likely that with a longer period of record this curve would have smoothed out, as would the others to a more limited extent. Table 1 shows that only about 20 percent of the days in the period May to August were cloudy, these being the months showing the greatest irregularity.

The average trend of the dew point on all days, regardless of the cloudiness or other factors indicates a marked tendency for a fall until noon or shortly after, and a decided rise in late afternoon and evening, with the exception of the winter months. This is shown in figures 1, 3, and 4 by the median curve. Values on which these curves were based were obtained from the original data by weighting each monthly figure with the percentage frequency occurrence of the condition represented.

CAUSES OF DIURNAL VARIATION IN DEW-POINT TEMPERATURE

The moisture content of the air at a given station is constantly fluctuating for reasons which can ordinarily be read off a weather map. This applies to the irregular variations resulting from changes in air mass, precipitation, etc. However, it is more difficult to explain the diurnal variation. An extensive air mass gradually increases its moisture content as it passes overland by evaporation from the ground and vegetation, at rates dependent upon the temperature, relative humidity and available moisture. The total amount of moisture picked up in this way is greatest during the day when temperatures are highest and humidities lowest, but appreciable evaporation continues throughout the night. Furthermore, it is obvious that under ordinary circumstances, all this moisture must be absorbed by the lower layers, and transferred to higher levels by diffusion, turbulence and convection. During the day moisture taken on by the lower layers is rapidly diffused throughout the troposphere by constant mixing, but with decreased wind velocities and greatly diminished convection at night, the atmosphere tends to become stratified. In a mountainous section like the Southern Appalachians, the tendency toward stratification is greatly enhanced by air drainage.

With continued evaporation of moisture into the ground layers at night and interference with the mixing process through stratification, the total moisture content increases appreciably until a maximum dew point is reached, probably near the time of the minimum temperature. This increase, together with the depression of the temperature, explains the frequent occurrence of morning fogs. Immediately after sunrise the air temperature increases by heating from the ground, convection is initiated by the heated air, the stratified condition is destroyed, and soon there is active mixing of all layers of the troposphere. As soon as such mixing is accomplished, the excess moisture, accumulated in the lower layers, is rapidly transferred to higher levels, resulting in a diminution of the dew point near the ground. It is difficult to say just how rapidly the dew point is depressed, but considering the fact that convectional activity reaches its approximate maximum near 10 a. m. or 11 a. m., the early forenoon drop must be most rapid. There is likewise some uncertainty as to the exact time when the minimum value is reached, but it is probable that little further fall occurs after a thorough mixing has been accomplished between lower and intermediate layers, since the rate of evaporation increases steadily, greater and greater amounts of moisture being added to the surface air for transference to higher levels. This process, together with other factors of lesser importance, accounts for the diminished dew points during the daytime.

The facts indicate that the dew point again rises during the late afternoon reaching a point substantially higher at 8 p. m. than 12 hours previous. The reason for this rise is probably the diminished wind velocity, with a resulting slower rate of moisture transference to higher levels. Simultaneously, the rate of surface evaporation, though diminishing, is still moderately high. The unexpectedly high evening dew points in Asheville are induced by the occurrence of a distinct valley breeze which operates throughout the year. The normal tendency toward a northwest wind during the day is reversed just after sunset, and a northwestward drift sets in bringing air from over the extensive forests to the southeast. Again, it is a matter to be settled by further research, whether the peak is reached in the early evening, or whether it increases constantly until the time of minimum temperature, but it appears reasonable that the peak should occur just before sunrise.

The foregoing discussion applies to clear or partly cloudy days. The trend is reversed for cloudy days. Two explanations may be offered. First, cloudy days are likely to be associated with the active portions of storms whose southerly winds have been shown to increase the dew point at a given station in their path. Secondly, the increased evaporation and transpiration during the day more than offset the loss of moisture by convection and turbulence, which are held to a low point by cloudiness and less active surface heating.

CAUSES OF SEASONAL VARIATION IN DEW-POINT DEPARTURES

It has been found that on clear and partly cloudy days, the depression of noon below morning dew points is greatest in the warmer months of the year; and that on cloudy days when a tendency obtains toward a daily rise, the smallest increases are found also in the warmer months. The two curves parallel each other with marked fidelity. It now remains to give an explanation of the observed facts. The fact that the curves parallel each other is an indication that the effect of cloudiness upon the trend of the dew point remains fairly well-fixed throughout the year. The seasonal variation itself can be explained on the basis of seasonal tendencies in diurnal wind changes, and varying degrees of storm activity. Other factors such as the general temperature level, varying length of day, seasonal activity of vegetative processes, and local peculiarities undoubtedly have a minor bearing, but the first two causes mentioned have the greatest effect.

Effect of seasonal variation in storm activity.—It has been pointed out that the principal cause for diurnal dew-point fluctuation is the cyclic change from night stratification to daytime turbulence in the atmosphere. Any factor which tends to interfere with this diurnal cycle will in turn tend to eliminate the daytime drop in the moisture content of surface layers. The winter season in these latitudes is marked by considerable storm activity, while in summer the passage of storms is much less frequent, and the atmosphere in general is characterized by comparative stability. Mixing of air layers is accomplished not only by thermal convection, but also by turbulence induced by horizontal winds. The higher the wind velocity, then, the more thorough the binding together of adjacent air layers, and the greater the rapidity with which moisture is transferred from the surface to higher levels. It is evident, then, that in winter, when storms are more intense, pass more frequently, and are accompanied by stronger winds, there is less opportunity for an excess of moisture to be stored in the surface air layers during the night. In the warm season, on the other hand, there is a maximum divergence between night stability and daytime convectional activity, the very conditions giving rise to large dew-point departures. Therefore, there is bound to be less difference between night and daytime dew points during the winter than in summer when nights are generally marked by surface inversions.

Effect of seasonal changes in diurnal wind variation.—Since wind direction has a good deal of influence on the level of the dew point, it seems logical that the diurnal direction variation might have a certain effect upon its daily trend. In this particular locality there is a definite diurnal shift in wind direction, part of which is due to valley and mountain breezes. The shift during all months of the year is toward the northwest by day, and the southeast by night. The cycle operates with considerable regularity during the warmer months, but for the remainder of the year, the southeasterly shift at night is confined to the early evening hours when the valley breeze is most active. If southerly winds tend to raise the dew point, it is evident that the difference between night and day figures should be greater in summer than in winter when the prevailing night wind direction is northwest instead of southeast. This explanation is not intended to convey the impression that a change in air mass accompanies the diurnal shift of wind. Indeed, this could not occur in every instance. Wind drift toward the northwest at night, however, does draw drainage air of comparatively high moisture content from extensive forests to the southeast, and this may in part account for the generally higher dew points associated with southerly winds. In the summer season, the evening valley breeze is particularly noticeable, and signals from this station frequently contain data for southerly surface winds, and low clouds moving from the northwest, which had been the surface direction until shortly after sunset.

CONCLUSION

The present study was prompted by a definite need for the information it affords, and which could not be found in any meteorological literature available at this station. It is not claimed that the results set forth are exact and complete, but the work has served to uncover the nature and approximate extent of diurnal dew point variations at this station. Further work along this line will be directed toward multiple correlation of dew point changes with various weather elements.